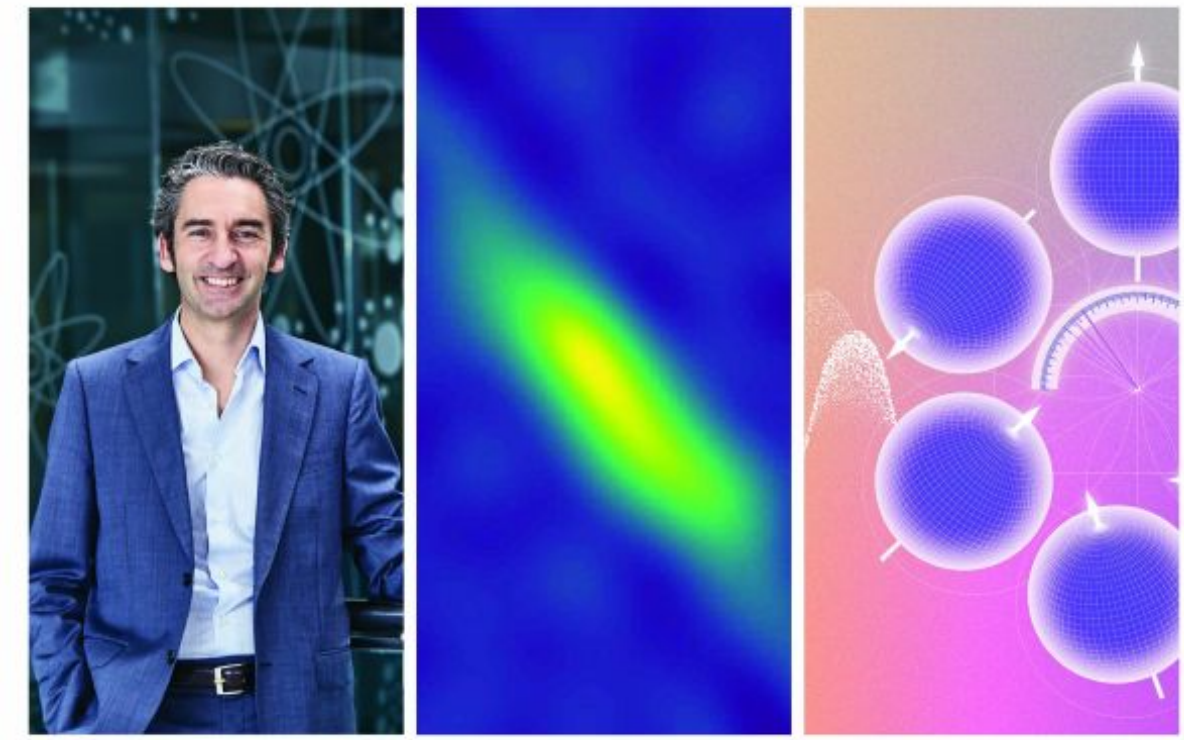

April Science News Recap

ICFO's summary of news highlights of the scientific discoveries and stories from the month of April 2026

April 30, 2026

April was packed with different scientific discoveries, results and findings that have sparked different stories to share. We've gathered the most important updates to keep you in the know. Whether you missed a few of them or just want a quick recap, our summary of April's top scientific news has you covered. Dive in and catch up on everything that happened this month.

News 1

New ERC Proof of Concept for Valleytronics

ICREA Prof. at ICFO Dr. Jens Biegert is awarded the ERC PoC to study optical computing solutions that use light to control states in materials, to offer a faster, more energy-efficient path for next-generation AI technologies.

The project seeks to move light-based computing from theory to practical prototypes by embedding ultra-thin materials into photonic crystal fiber waveguides, thereby enabling

efficient light control and direct compatibility with electronic systems. The research builds on recent advances in controlling a quantum property known as valley polarization-a key concept in next-generation electronics.
Date: April 7, 2026
Topic: Valleytronics.
ICFO Researchers: Prof. Jens Biegert.
Read more ...

News 2:

Quantum backaction: from obstacle to resource

In a recent Physical Review X study, ICFO researchers challenge the conventional view in quantum machine learning that quantum backaction (the disruptive effect measurement has on quantum systems) is purely detrimental.
They demonstrate that, instead, it is a valuable resource when properly controlled. In particular, the team shows how tuning the measurement strength can enhance the memory and predictive capabilities of the quantum reservoir computing algorithm.
Date: April 8, 2026
Topic: Quantum computing.
ICFO Researchers: Giacomo Franceschetto, Dr. Marcin P?odzien, Prof. Maciej Lewenstein, ICREA Prof. Antonio Acin, and Dr. Pere Mujal.
Read more...

News 3:

Shaping and reconstructing quantum harmonics

High harmonic generation (HHG) is a highly non-linear phenomenon in which a system (for example, an atom) absorbs many photons from an incoming laser and emits a single photon of much higher energy (a harmonic of the absorbed photons). Recent discoveries have shown that it is possible to produce photons with quantum features, such as squeezing and entanglement, but an efficient way to control and analyze them has not yet been found.
Now, researchers at ICFO have published a protocol in Physical Review X to extract and tun the quantum features of these photons, even when their frequency lies in the extrem ultraviolet (XUV) regime, where conventional methods reach their limitations. The r approach, which is conceptually new, fully merges HHG with quantum optics, bringing t o increasingly connected fields, attosecond science and quantum optics, closer togethe
Date: April 22, 2026
Topic: Quantum optics
ICFO researchers: Dr. Javier Rivera-Dean, Lidija Petrovic, Prof. Dr. Maciej Lewenstein, and Philipp Stammeri.
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